

REMARKS

Applicant has reviewed and considered the Office Action mailed on March 17, 2008 and the references cited therein.

Claims 1 and 32-38 have been amended herein. No claims have been canceled or added. As a result, claims 1-43 are still pending in this application.

Claim Objections

Claim 1 was objected to because of an informality in the preamble. The preamble of claim 1 has been amended in a manner that is believed to address the Examiner's concerns. That is, the phrase "for use in a wireless network" has been deleted from the preamble of claim 1 and the phrase "in a cell of a wireless network" has been added to the body of claim 1 to clarify that the "plurality of orthogonal sets of user devices" are located within a cell of the network.

35 USC § 112 Rejection of the Claims

Claim 32 was rejected under 35 USC § 112, first paragraph, as being based on a disclosure which is not enabling.

The specification has been amended herein in a manner that is believed to address the Examiner's concerns. That is, the terms "storage medium" and "computing platform" have been added to the description portion of the specification. As these structures were originally disclosed in the claims, which is part of the specification, no new matter has been added.

35 USC §102 Rejection of the Claims

Claims 1-6, 17-25, 32-34 and 39-42 were rejected under 35 USC § 102(e) as being anticipated by Barratt et al (U.S. 6,185,440 A1) (hereinafter Barratt).

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920

(Fed. Cir. 1989) (emphasis added). The elements must be arranged as required by the claim
In re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990) (emphasis added).

Claim 1 is an independent claim that is directed to a method comprising: (a) identifying a plurality of orthogonal sets of user devices, wherein each orthogonal set in said plurality of orthogonal sets includes multiple user devices that can be transmitted to concurrently by an access point using different antenna beams; (b) selecting an orthogonal set from the plurality of orthogonal sets based on a predetermined selection criterion; and (c) initiating a spatial division multiple access (SDMA) exchange for the selected orthogonal set.

Barratt does not disclose or suggest “identifying a plurality of orthogonal sets of user devices in a cell of a wireless network, wherein each orthogonal set in said plurality of orthogonal sets includes multiple user devices that can be transmitted to concurrently by an access point using different antenna beams.” “selecting an orthogonal set from the plurality of orthogonal sets based on a predetermined selection criterion,” or “initiating a spatial division multiple access (SDMA) exchange for the selected orthogonal set.” As is clear from the claim language, the orthogonal sets in the plurality of orthogonal sets are sets of “user devices.” In addition, each set includes “multiple user devices that can be transmitted to concurrently by an access point using different antenna beams.” For example, with reference to Fig. 1 of the present application, user devices A, B, and C can be transmitted to concurrently using different antenna beams 22, 24, 26. Barratt does not teach the identification of a plurality of such sets. Similarly, Barrett does not teach the selection of such a set from the plurality of sets or the initiation of and SDMA exchange using the selected set.

Barratt is directed to a method for sequentially transmitting a downlink signal from a communication station that has an antenna array to achieve an omnidirectional radiation. The downlink signal is transmitted multiple times in series, each time using a different weight vector in a series of weight vectors to steer the antenna beam in a particular direction. The method sequences through the series of weight vectors (i.e., sequentially) to, over time, achieve omnidirectional coverage. The Examiner takes the position that Barratt discloses “identifying a plurality of orthogonal sets of user devices” in Fig. 1 because the antennas 109.m would be transmitting to subscribers (not shown in Fig. 1). The Applicants respectfully disagree. The antennas 109.m may be transmitting to multiple subscribers, but this does not constitute

“identifying a plurality of orthogonal sets of user devices” as that phrase is defined in claim 1. There are no “sets” of “user devices” being “identified” in Fig. 1. There is, at most, a number of subscribers that can communicate with the structure of Fig. 1 via antennas 109.m. In addition, Barratt does not disclose the identification of sets of user devices, wherein each set includes “multiple user devices that can be transmitted to concurrently by an access point using different antenna beams.” As shown in Fig. 1 of the present application, the AP 12 can transmit to an orthogonal set of devices A, B, and C at the same time (i.e., concurrently) using different antenna beams 22, 24, 26. In contrast, Barratt sequences through a series of weight vectors (over time) to obtain coverage of a region. The Examiner takes the position that Barratt shows, in Fig. 1, that “the AP transmits its processed signal 106.m via different antenna beams 109.m.” It may be true that each antenna 109.m of Fig. 1 can be considered to be generating a separate antenna beam, but this still does not teach the identification of sets of user devices as defined in the claim.

Barratt also does not teach “selecting an orthogonal set from the plurality of orthogonal sets based on a predetermined selection criterion.” As described above, Barratt does not disclose the identification of a plurality of orthogonal sets, so it cannot disclose the selection of an orthogonal set from such a plurality. The text at column 7, lines 44-54 of Barratt (as identified by the Examiner) is referring to “clustering” of the weight vectors in the series of weight vectors used by Barratt. This technique starts with a set of weight vectors that includes one weight vector for each of the known subscriber unit and iteratively determines a smaller set of weight vectors that is representative of the original set. The smaller set may then be used to cover the desired coverage area. Again, Barratt sequences through the series of weight vectors in series. Barratt does not transmit to two or more weight vectors at the same time.

Furthermore, Barratt does not teach “initiating a spatial division multiple access (SDMA) exchange for the selected orthogonal set.” As described above, Barratt does not disclose the selection of an orthogonal set, so it cannot initiate an SDMA exchange for a “selected” orthogonal set. Barratt does disclose the use of SDMA techniques, but it does not disclose or suggest the initiation of an SDMA exchange for a selected set.

Based on the foregoing, it is submitted that claim 1 of the present application is not anticipated by Barratt. Reconsideration and allowance of claim 1 is therefore respectfully requested. If the Examiner maintains this rejection, it is respectfully requested that he identify in

the next office communication, with specificity, what are the “orthogonal sets of user devices” disclosed in Barratt, where are these orthogonal sets “identified” in Barratt, where Barratt teaches the “selection” of an orthogonal set from a plurality of sets, and how is an SDMA exchange “initiated” in Barratt for a selected orthogonal set. Similar arguments apply to independent claims 20, 32, and 39.

Claims 2-6 and 17-19, claims 21-25, claims 33-34, and claims 40-42 are dependent claims that depend either directly or indirectly from independent claims 1, 20, 32, and 39, respectively. Consequently, these claims are allowable for at least the same reasons as their corresponding base claims. These claims also provide further bases for patentability. For example, claim 2 further defines “selecting an orthogonal set” of claim 1 as including “selecting a set based on an amount of data that is buffered for delivery to user devices within each of said identified orthogonal sets.” Barratt does not teach selecting an orthogonal set from a plurality of orthogonal sets of user devices based on an amount of data that is buffered for delivery to user devices within each of the identified orthogonal sets. The examiner takes the position that Barratt discloses this in column 16, lines 11-16 because “a ‘weight’ can be user defined criterion and therefore amount of data can be one such ‘weight’ vector.” However, this passage in Barratt states nothing about a weight being user defined and, even if it did, it is irrelevant because a “weight” is not the same thing as an orthogonal set of user devices. A weight vector is a data structure used to form an antenna pattern (see, for example, column 7, lines 7-14). A similar argument applies to claims 22 and 33. Claim 3 further defines “selecting an orthogonal set” of claim 1 as including: (a) determining a maximum duration for the SDMA exchange; (b) evaluating orthogonal sets in said plurality of orthogonal sets to determine an amount of data that is buffered for said orthogonal sets; and (c) selecting an orthogonal set that has a largest amount of buffered data that can be delivered within said maximum duration of said SDMA exchange. Claim 3 is allowable for similar reasons to claim 2 above. A similar argument applies to claim 23.

Claim 4 further defines “selecting an orthogonal set” of claim 1 as including “using quality of service (QOS) information as part of said predetermined selection criterion.” Barratt does not disclose the use of QOS information as a selection criterion in the selection of an orthogonal set of user devices from the plurality of orthogonal sets. The Examiner takes official

notice that the use of QOS is known in wireless and wireline communications; but even if this is true, the Examiner still has not shown prior art showing the use of QOS information being used as a selection criterion in the selection of an orthogonal set of user devices. Claim 5 further defines "selecting an orthogonal set" of claim 1 as including "using latency related information as part of said predetermined selection criterion." Barratt does not disclose the use of latency related information as a selection criterion in the selection of an orthogonal set of user devices from a plurality of orthogonal sets. The Examiner takes the position that Barratt discloses this in column 20 lines 31-46; however, this passage does not describe the use of latency related information as such a selection criterion. Claim 6 further defines "initiating an SDMA exchange" of claim 1 as including "simultaneously transmitting data to user devices in said selected orthogonal set, using corresponding antenna beams, so that a terminal end of the data transmitted to each user device occurs at substantially the same time." This is not shown in Barratt. Substantially the same argument applies to claims 25, 34, and 42.

Claim 17 further defines "initiating an SDMA exchange" of claim 1 as including "transmitting a training request packet to a first user device within the selected orthogonal set." Barratt does not disclose the initiation of an SDMA exchange that includes transmitting a training request packet to a user device within a selected orthogonal set. As described previously, Barratt does not disclose the selection of an orthogonal set of user devices or the initiation of an SDMA exchange for a selected set. Likewise, Barratt does not disclose the transmission of a training request packet to a user device within a selected set. The Examiner takes the position that a weight can be designated as a training request packet. The Applicant does not understand what this means and respectfully requests that the Examiner explain this argument in more detail in the next official communication. A similar argument applies to claim 19. Claim 18 further defines the "training request packet" of claim 17 as being "transmitted using an antenna beam that encompasses substantially an entire coverage region of the access point." Barratt does not disclose this.

35 USC § 103 Rejection of the Claims

Claims 7-11, 13, 14, 16, 26, 27, 29-31, 35-38 and 43 were rejected under 35 USC § 103(a) as being unpatentable over Barratt in view of Kasami et al. (U.S. Pub. No. 2002/0181492 A1) (hereinafter Kasami).

Claims 7-11, 13-14, and 16; claims 26-27 and 29-31; claims 35-38; and claim 43 are dependent claims that depend either directly or indirectly from independent claims 1, 20, 32, and 39, respectively. Consequently, these claims are allowable for at least the same reasons as their corresponding base claims. These claims also provide further bases for patentability. For example, claim 8 further defines “initiating an SDMA exchange” of claim 1 as including “simultaneously transmitting data to user devices in said selected orthogonal set using corresponding antenna beams” and “transmitting an acknowledgement (ACK) request to each user device in said selected orthogonal set after said data has been transmitted.” Neither Barratt nor Kasami teach or suggest the transmission of ACK requests after transmitting data to user devices in a selected orthogonal set. The Examiner refers to paragraph 126 of Kasami, but this paragraph states nothing about ACK requests (it only mentions a transmission request). A similar argument applies to claim 35. Claim 9 further defines “transmitting an ACK request” of claim 8 to include “transmitting a separate ACK request to each user device in said selected orthogonal set using a corresponding antenna beam.” Again, neither Barratt nor Kasami teach or suggest the transmission of ACK requests after transmitting data to user devices in a selected orthogonal set. The Examiner refers to paragraphs 6, 9, 65-69, and 106-109, but these paragraphs refer only to ACK packets, not ACK requests. Similar arguments apply to claims 10, 11, 13, 14, 29, 30, 36, 37, and 43.

Allowable Subject Matter

Claims 12, 15, and 28 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. As it is believed that the independent claims are in form for allowance, claims 12, 15, and 28 have not been rewritten herein.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (480-948-3745) to facilitate prosecution of this application.

Respectfully submitted,

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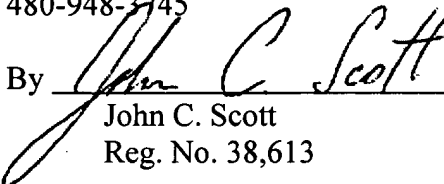
By their Representatives,

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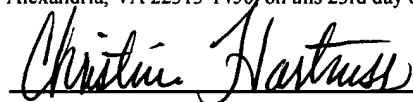
Date May 23, 2008

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